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NECESSITY MAY MAKE U. S. GROW LONGER COTTON.

Egypt, one tenth the size of the United States, with cotton fields one twentieth as big, can twist the elephant's tail. Although more than half of the world's crop grows on American soil and a third of all the cotton in foreign mills comes out of American gins, American manufacturers get exceedingly nervous if a few dusky Egyptian planters decide to make it lentils and beans this year instead of cotton.

The reason is that there is cotton and cotton. The kind that grows under Egypt's desert sun has the longest, finest fibers of any in the world, except the Sea Island cotton which grows in small quantities in the West Indies. American manufacturers like to use it for cord tires and tire fabric, and it is also used in making very fine cotton goods.

The Egyptian government, which regulates all agriculture, through the simple fact that it can turn off the water in its irrigation canals by a mere twist of the wrist, occasionally deems it advisable to take a tuck or two in the cotton acreage. This has been done at least twice in the last ten years, U. S. Department of Commerce officials say. And now, they claim, restrictions have been proposed for the 1926 crop which will be planted this spring.

A statement of Secretary Hoover to a congressional committee investigating foreign monopolies that control American necessities is as follows:

"The motive behind the restriction of acreage may be attributable to one of two reasons, or possibly both. Cotton in Egypt is raised under irrigation depending on the reservoirs of the upper Nile, and from time to time there are shortages of water, and we may consider this the cause. However, there appears to be no such condition existing at the present time, and there is reason to believe that the intention to restrict acreage during the coming season is based upon the desire to influence prices."

Although the United States raises a small amount of Egyptian cotton of its own in Arizona and California, it has not been as popular as the imported kind. Spinners claimed the American long staple or pima cotton could not be worked as well because it was not as carefully handled as that from Egypt. At any rate the demand tapered off, and the production of pima cotton dwindled from over ninety thousand bales in 1920 to about four thousand in 1924.

There is no real reason why the United States should be dependent on Egypt for this product, in case of need. The climate and length of season in Arizona is very much as it is in Egypt. It is a question of labor, and of prices. Pima

cotton costs more to produce as it requires greater care. Egypt has cheap labor and can compete successfully in spite of transportation rates.

The prosperity of Egypt fluctuates with its cotton, the most important crop. It is believed by people who have observed conditions that the government manages this goose which lays the golden egg with utmost care. When cotton prices go low, Egypt restricts the area to be planted the next season, until prices climb up again. When they go high, the government attempts to peg the price by buying in the market and doling it out in wise quantities.

Whatever blame may attach to Egypt, it must be remembered that it is a country that has to maintain itself on artificial water supply because it practically never rains. It must exercise great economy to bring comparative economic comfort to the 14,000,000 people that crowd the narrow valley of the Nile. Although the area under Egyptian rule is over 300,000 square miles, only a little over 12,000 square miles is aratle.

It is always possible to increase this farm land by more extensive irrigation, limited of course by the amount of water the Nile can supply. Thousands of years before the time of Christ, and back in the days of Tutankhamen, irrigation was practiced in Egypt. Practically the same old system was used until recent times, and under the rule of Great Britain it was developed to its greatest heights.

The Nile is a great artery that keeps Egypt alive. It begins in the heart of Africa at Victoria Nyanza and flows almostdue north to the Mediterranean, a total distance of about 3500 miles, or farther than from New York to San Francisco. In about the last 1000 miles of its vast journey it is not augmented by a single tributary stream.

Although the most selfish methods of Egypt could never bring on an economic crisis in the United States, still they could cause a temporary discomfort in manufacturing fields. If the boll weevil should be conquered at some future time, the fine long Sea Island cotton might again be grown in the Carolinas as it once was.

Bringing cotton to the United States is like carrying coals to Newcastle, but it is, as has been said, a matter of the kind of cotton. China, India, Peru and Mexico also send us some of their cotton, which finds its way into blankets, wool mixtures and cheap yarns.

BENDING OF RADIO WAVES CAUSES "FREAK" TRANSMISSION

Bending of the radio waves in the upper atmosphere, in somewhat the same way as a beam of light is bent when crossing a hot stove or highly heated ground, is responsible for many of the curious and apparently contradictory effects observed in radio transmission with short waves, according to William G. Baker and Chester W. Rice, of the research laboratory of the General Electric Company. Just as the bending of light waves over a desert sometimes brings into view objects far beyond the horizon, and produces a mirage, when the radio waves are bent it may be possible to hear signals from a distant station though nearer receiving sets cannot detect them.

"Experiments in short-wave (i. e. 60 to 15 meters) transmission made during the past two years have definitely brought to light many peculiarities which were entirely unexpected as extensions from our many years of long-wave experience," said Mr. Baker. "Until recently any announcement of long-distance short-wave transmission was put down as an unexplained freak by the average radio man, and dismissed from his mind. As the number of such reports increased, we could no longer be content to dismiss them as freaks. We were forced to abandon our preconceived notions as to what normal short-wave transmission should be.

"As a typical example of the peculiarities of short-wave transmission, let us describe the experience obtained with a 5 kw., 30 meter transmitter. Here the signal strength rapidly decreases as we leave the transmitter and reaches the lower useful limit at about 70 miles. This short range is what might be called the unexpected value as viewed from our long-wave experience. If now we continue to greater distances the signal remains out until we reach approximately 450 miles, where the day signal unexpectedly becomes strong again.

"Continuing to greater distances we find the signal gradually falling off in intensity and reaching the limit in the vicinity of 4500 miles by day. On a summer night the signal does not reappear after the 70 miles extinction until we are approximately 2000 miles from the transmitter, after which the signal falls off gradually to a very low value at 7500 miles."

These effects, which vary in amount according to the wave length and power of the transmitting station, are explained by the investigators as being due to the presence high up in the atmosphere of a layer of free electrons, of which the atoms of matter are supposed to be made. Nearby receiving sets hear the transmitting station by the direct waves as these go out in all directions from the aerial, but these waves that rise in the air enter this electron layer, and are refracted so that they are bent downwards again. However, the waves which ascend almost or entirely vertically are not refracted, and so are not brought back to the earth, and the 450 mileday limit represents the line reached by the waves which have just been far enough from the vertical to be refracted. At night time the layer of free electrons is at a greater altitude and so the nearest return of the "sky wave", as it is termed, is farther than in the day.

Fading, the bane of the broadcast listener's existence, may be caused when the sky wave comes back to earth within the limit of the ground wave, causing interference between the two. However, as the work of Mr. Baker and Mr. Rice has revealed some of the laws which govern the short waves, it may now be possible to design sets which will give the best transmission between two particular points.

BODY MAY PUT UP WITH DEFECTIVE DIET

Evidence that the bodies of men and animals are not quite so exacting in their protein food demands as biochemists had supposed is obtained from important experiments in nutrition performed at the University of Illinois, by Drs. William C. Rose and Gerald J. Cox.

The experiments resulted in successful use of an artificial product to replace histidine, which was previously thought to be one of the 20 building stones of protein essential for the growth and development of men and animals.

The fundamental raw materials for the survival, growth and reproduction of animals have been grouped under four heads; sufficient fat or sugars to supply energy for body heat and locomotion; a small amount of metallic salts; accessory substances, known as the vitamins; and nitrogenous materials containing some of each of the 20-odd "amino-acids" of which the proteins are constructed.

Hitherto, animals fed on artificial diets lacking one or more of the amino-acids, failed to develop properly. Dr. Rose demonstrated, however, that experimental laboratory animals reached maturity if instead of histidine a substance similar but lacking the characteristic amino group, was eaten.

"This is the first time that a synthetic product, devoid of an amino group, successfully replaced histidine", Dr. Rose explained. "Growth, while not so rapid, was decided."

Presumably, the successful substitute, imidazole lactic acid, stole an amino group from other amino-acids in the artificial diets.

The discovery may be of twofold practical significance, it is pointed out. Proteins classed as "incomplete", such as gelatin which lacks three of the essential amino-acids, may be rendered adequate from the nutritional point of view, by the addition of relatively simple compounds. Again, future economic or agricultural conditions may render it expedient to manufacture food proteins, instead of waiting for the process to be carried on naturally by plants. In such an event, the synthetic chemists now know that substances approximating, but not duplicating the natural materials, may be adequate for maintaining the health and functioning of the body.

The report is of particular interest in view of the fact that histidine is a constituent of nearly all common proteins and as such has been regarded as fundamental.

BEE AND SILKWORM DISEASES MAY BE FOUGHT WITH OXYGEN

Diseases of bees, silkworms, fishes and even plants, caused by the minute one-celled animals known as protozoa, may be banished by means of the common element oxygen applied under pressure, according to Dr. L. R. Cleveland of the Harvard University Medical School. Preparation of immunizing cultures against certain diseases, ridding stored nuts and grain of insects, and the study of the life-relations between the protozoa in the bodies of animals and the animals that thus harbor them, are other problems suggested whose solution may be sought by means of oxygen under pressure.

One of the most troublesome and expensive diseases of silkworms, Dr. Cleveland points out, is caused by a certain protozoan species. He has found in his earlier studies that infected insects can be placed in bottles of pure oxygen at moderately high pressures without harm to the insects but that after this treatment the protozoa are all dead. He therefore suggests this treatment for protozoan-plagued silkworm colonies, and for bee "nuclei", consisting of a queen and a few workers, with which a hive is usually started when a choice bee strain is to be introduced.

After pointing out the possibility of obtaining protozoan-free plants and insects for the purpose of making a study of certain puzzling plant diseases, Dr.

Cleveland brings his argument closer to man, stating: "It has been reported that flagellates producing a disease in plants may, after passage through an invertebrate (insect) and a vertebrate host (lizard), acquire pathogenic properties for a mammal. Oxygenation will perhaps give us uninfected but susceptible hosts to work with, which will enable us to determine beyond question the possible method or methods of infection in nature."

Dr. Cleveland's earlier work on the effects of oxygen on protozoa and their insect hosts won him half of the annual prize of the American Association for the Advancement of Science at its meeting in Washington during the holiday week in 1924.

SUPERSENSITIVE INDIVIDUALS GET ASTHMA FROM LIGHT

The fairy story princess who spent a miserable night because of a pea concealed under the nine mattresses in her bed was no more sensitive than some everyday human beings.

In the laboratories of Dr. W. W. Duke, hay fever and asthma are being studied, and he has shown that an individual may be sensitive to light or to certain temperatures, just as hay fever victims are sensitive to ragweed pollen or other proteins.

Dr. Duke has illustrated with human patients how weals can be produced in a very few moments on the body of a person who is sensitive to heat or cold or light, and he has shown how such exposure to a physical agent may lead to asthma or to all the symptoms of anaphylactic shock.

Persons are sometimes sensitive, Dr. Duke finds, not to many degrees of cold but only to a definite small range of temperature, as from ten to fourteen degrees above freezing. These patients showed no sensitivity to a temperature around the freezing point. Ice could be pressed against their skin without producing abnormal effects. Yet a short exposure of an area of the skin to a slightly higher temperature produced ugly weals.

This type of case has been little studied and is almost unknown to the average physician. No cure is known for it. The person who is sensitive to a protein can be treated with gradually increasing doses of the toxic substance until his tolerance is much greater, but the patient who is supersensitive to light or heat must always avoid the particular type of radiation that poisons him.

The condition, which is known to medical science as allergy, may be produced not only by pollen proteins and radiations, but also by smokes, meat and fish proteins, and fish glue. There are a number of theories as to the cause of allergy, Dr. Duke explains, but so far none has been substantiated.

A little village in the wilds of British Columbia has a museum of Indian art and craftmanship, founded by an Indian chief.

BABIES DISPLAY TEMPERAMENT IN PERSONALITY TEST

That children as young as two and three years of age can be sorted out according to emotional temperament, has been shown by an experiment with 100 children from two to six years old, conducted by Dr. Leslie R. Marston, at the Iowa Child Welfare Research Station at the University of Iowa.

The experiment, which has just been reported, shows that the two year old, who can scarcely talk, is already developed into a personality type so marked in character that habitual emotional reactions may be expected.

Dr. Marston classifies the young subjects of his experiment into introvert and extrovert types, a division commonly used in analyzing character. An extrovert of any age expresses his emotions in actions, he explains, while the introvert inhibits expression and uses his emotional energy within his own body.

The term introvert, "turned inward" suggests the person whose center of attention is himself. According to the rating scale, the introvert is habitually self-conscious and easily embarrassed; he is reserved and prefers to work and play alone, is sensitive, modest, and yields to others rather than oppose them. He is careful and good at details, deliberative, slow, and tends to stay in a rut and avoid new situations. He underestimates his own ability, is moody and worries. The extrovert, whose emotions and thoughts are "turned outward", has the opposite characteristics.

The children were rated in 20 traits according to this scale, in addition to the introverts and extroverts, some of the children were classed as an in-between type, called by Dr. Marston the ambiverts--"turned both ways"--who are introvert in some particulars, extrovert in others, but less extreme in their reactions than the true introverts and extroverts.

To verify the rating, Dr. Marstonsubjected the children to test situations. For instance, to test the child's degree of aggression, he was left alone in a room with a stranger - the experimenter - who had an interesting toy. At first the experimenter paid no attention to the child, then smiled and finally, if necessary, invited him to play with the toy. By means of a stop watch, he timed the child's reactions, at the same time making notes of the child's movements and remarks. Introverted children moved away or stood still, some even refusing the most urgent invitations. Children of the extrovert type came at once to the toy and in friendly spirit said, "Hello". Similar tests were given on other points and the children were found to behave consistently according to their personality types.

Dr. Marston does not speculate as to whether the personality types are inborn or acquired through social experience after birth, but states that boys tend to be more extroverted than girls, that extroversion decreases with age, and that the type reactions may be modified with training.

NEW INSECTICIDE MADE WITH AIR

Consternation among the bug pests of southern California is expected to follow the introduction of calcium cyanide, a new death-dealer which appears to be the most powerful agricultural poison yet known. Information just released by

Dr. Robert W. Poindexter, cyanide chemist, indicates that a long period of industrial research has now put calcium cyanide into the commercial arena. The product as now made in southern California is prepared largely from the nitrogen of the air and from natural gas.

Recent field tests show that calcium cyanide is much more potent than pure hydrocyanic acid, or prussic acid, heretofore considered the ultimate 100 per cent. of toxic power. This unexpected result so far is not explained. After one test of calcium cyanide this winter in an orange grove, where a very resistant strain of scale insects was infesting the foliage, only two bugs were found alive among over 3000 insects actually counted. This record is especially encouraging to growers who have found the scale pests gradually developing immunity to regular doses of hydrocyanic acid. As one orchardist suggests - "the ancestors of the scale have been killed so often that their progeny don't mind it any more."

Calcium cyanide, while theoretically appearing to be a simple preparation to the ordinary chemist, is impossible to make in any ordinary way. By combining calcium carbide with hydrocyanic acid, however, a light brown powder is secured and this substance has the remarkable power of pouring out a verttable wave of poison gas when it is merely exposed to common air. Fumigators simply blow the poison in a dust cloud under the regular orchard tent; and whatever animal was living under the tent dies, regardless of whether it be a scale insect, a luckless owl or an itinerant rooster.

APES AND MAN UNTANGLED BY GOVERNMENT SCIENTIST.

Just where the higher apes belong on the zoological family tree, and exactly what names we have a right to call these hairy cousins, has been the subject of an exhaustive study by Dr. C. W. Stiles of the U. S. Public Health Service, who has just completed a 150-page treatise on the subject.

"This may look like a question of interest only to zoology professors," said Dr. Stiles, "but the exact opposite is the case. The study was undertaken in the first place because of its very great practical importance. Apes and monkeys are indispensable nowadays in the experimental study of human diseases, and a great deal of confusion and some possibly dangerous mistakes can be caused in medical and bacteriological circles when the same name is given by different men to entirely distinct species of apes, one of which might be very susceptible to a given disease and the other immune. So a straightening up of the whole situation was necessary, if we are really to know what we are talking about.

"My survey of the literature on apes and monkeys took me back to the year 1551," Dr. Stiles continued. "The confusion of names began then, and it has not been straightened out yet. Not merely apes but the human species also, were involved by the earlier writers, who lived long before Darwin and so far as I know never gave a thought to evolution. Some of them listed apes as a kind of man, others considered certain types of men as apes. Even as late as 1829, a freak human being who was discovered was described and pictured as an ape.

"One interesting side-light on this situation is afforded by the name of the big East Indian ape, the orang-utan. 'Orang' is a Malay work meaning 'intelligent being'; it is applied not only to man and the orang-utan, but also to the elephant. Roughly, it may be said to mean 'man'. 'Utan' means 'of the woods'. 'Orang-utan'

therefore means 'man of the woods'. One early scientific name of the orang-utan was a literal translation of the Malay into Latin: "Homo sylvaticus". A later but only slightly freer translation was made by P. T. Barnum, his 'wild man of Borneo' was simply an orang-utan."

In order to end the confusion of names among these animals, Dr. Stiles has decided to cut the Gordian knot, and instead of trying to determine exactly which ones among the many names that have been given to them should be applied to the various species, he will appeal to the International Committee on Zoological Nomenclature to authorize the use of names on which no conflict in use exists.

GOVERNMENT GEOLOGIST SEEKS OIL IN ALASKA

Oil in the Arctic is the objective of Dr. Philip S. Smith of the U. S. Geological Survey, who has just left for Alaska to continue his survey of the Government's great oil reserve on the shores of the Arctic Ocean. According to present plans, the party will make a 700-mile trip overland with dog sledges from Nenana, the northern terminal of the Alaska Railroad, to Kotzebue, on an arm of Bering Strait, and thence northeastward across the unexplored Arctic coastal plain and adjacent regions. From April until September they will be wholly out of touch with civilization, and will have to subsist entirely on supplies which they will carry, plus what game the country affords.

"Of course there is oil there," Dr. Smith told a representative of Science Service. "There is a great deal of it, if our explorations during the past two years mean anything. But we must not immediately jump to the conclusion that the Navy is sure of fuel in unlimited supplies. If you will look at the map you will see that there are some very difficult problems to be solved before we can get the oil out.

"Even though the best indications we have found so far are near the sea, it is unlikely that tankers can be used to carry the oil. That part of the Arctic is free of ice for only about one month in the year, and not entirely free even then. Moreover, there are no harbors, and large ships have to lie at least a mile off shore. That would mean an almost impossible job of storage and loading, and would require a whole navy of tank ships.

"I am not intending to throw cold water, however. If we discover oil in large enough quantities to justify it--and that would require very large quantities --the railroad could be pushed through, or a pipe line built. But a pipe line would present problems of its own. The mean annual temperature of that region is only ten above zero, and the line would probably have to be kept heated at frequent intervals, or the oil would become too thick to flow. Fortunately, there is a good deal of bituminous coal up there, so we probably would not have to burn some of the oil to heat the rest. However, all this is speculation as to the future; what we have to do just now is first catch our oil."

According to Dr. Smith, the Arctic slope of Alaska is not a very exciting country. For seventy-five or eighty miles inland from the coast, it is flat tundra, more or less marshy and traversed by slow, meandering rivers. Then there is a rise, a sort of low piedmont, sloping up to the foot of the interior mountain range. This region more or less resembles parts of Oklahoma and eastern Colorado,

except that the vegetation is dominated by low bushes, mosses and lichens, instead of the grass of the Plains states. The principal large game is caribou on the lower levels, and mountain sheep as one gets up into greater altitudes.

MUCH TIMBER LAND NOW LYING IDLE

Despite the efforts of the U. S. Government in the past half century to encourage forests, 81 million acres of land suitable only for timber growth are now lying idle. This denuded area, moreover, is chiefly in the East where the lumber is most needed for manufactures.

But this is not to the discredit of the United States Forest Service. Without itsaid, the figure would have been much worse. The forestry service has taken great strides towards conservation since Dr. Franklin B. Hough began his research and educational program of reforestation and protection in 1876, the semicentennial of which will be celebrated this year.

A half-century ago there were no Government-owned forests set aside for conservation. Today 21 per cent. of the 470 million acres of forest land in the United States is owned by the public--nation, state, or municipality, reports William B. Greeley, chief forester.

We use forest products in such a multiplicity of ways that they are a great drain upon our forests--in pencils, paper, turpentine, resin, soap, shoes, automobiles, boats, and even in artificial silk. As the population goes uphill our forests go downhill. Four times as fast as the forests can be replenished, they are being depleted. Two hundred and fifty million trees of average size are cut every year, or an area equal to Massachusetts, Connecticut, and New Jersey put together. A large amount of this lumber is used by newspapers, for it takes 16 acres of spruce trees to make the paper for one Sunday edition of a metropolitan newspaper.

Mr. Greeley sees as one help to the situation the making of forestry a part of diversified agriculture, that is, forest planting on farms and the practical instruction of farmers in forestry. Already 150 million acres of forest land--nearly one third the total for the entire country--is in farm holdings. Fifteen states now maintain forest nurseries from which small trees are furnished at nominal cost to farmers and other landowners desiring to plant them.

NEW RAYS FILL UNKNOWN GAP

Another gap in the spectrum of radiation, which includes light, X-rays, radio waves, and the very short rays investigated by Millikan, has now been filled, it was announced recently by Wynn Williams of the University of North Wales. He has been making investigations of sparking between electrodes and accidentally found the new rays, which are believed to fill part of the gap between the longer X-rays and the short ultra violet rays, which lie beyond the violet in the visible spectrum. It is stated that the new rays will penetrate air for several meters and will go through thin celluloid films, but are stopped by solids such as gold leaf and even thin mica

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TABLOID BOOK REVIEW

FOOD, NUTRITION AND HEALTH by E. V. McCollum and Nina Simonds. Baltimore, Md. Published by the authors. $1.50.

In this handy volume the pioneer of the newer knowledge of nutrition gives in simple language the fundamental principles of dietetics and their application to the daily dietary. Those who need to know what has recently been learned by experimentation about vitamins and balanced rations will find it here stated succinctly and conservatively. The chapters on "How to Reduce Weight" and "How to Increase Weight" will serve to save the reader from the folly of food faddists and fakes. A good book for the open shelves of school or public library.

E. E. SLOSSON

OUR FEAR COMPLEXES. By Edward H. Williams and Ernest B. Hoag. Indianapolis. Bobbs Merrill. 1923. $2.50.

The unfortunate prominence of natural and morbid fears in the lives of human beings is here discussed. The book is written in simple language, to explain to the layman the glands and their relation to emotion, also the theories of Freud and Coue, and other therapeutic measures. One puzzling paradox appears at the end of the book. The authors here point out that the fearful person is to a large degree a victim of morbid self interest and advise him to transfer his interests to other people and other things. Which leaves us wondering whether a 300 page discourse on fear mechanisms and remedies is not a contradictory prescription if recommended to the fearful reader.

Plant life cannot exist more than 600 feet below the sea, but animal life is found at depths of almost four miles.

The four chief causes of death in the United States, in order, are: heart diseases, pneumonia, cerebral hemorrhage and softening, and cancer.

The Egyptian pyramids were buildings used for burial, but the Mexican pyramids were only foundations for buildings.

The ultra-microscope, which uses ultra violet instead of ordinary light, is aiding in the study of invisible disease germs.

When anthracite coal was first taken from the Pennsylvania beds, it was unpopular because people tried to burn it like soft coal.
